IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Schmitt, et al.**	§	Case: **AMAT/8568/DSM/BCVD/JW**
Serial No.: **10/812,717**	§	Filed: **March 29, 2004**
Examiner: **Lafond, Ronald D.**	§	Group Art Unit: **1709**
Confirmation No.: **3736**	§	
Title: **DEPOSITION OF LOW DIELECTRIC CONSTANT BY N_2O ADDITION**	§	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

DECLARATION UNDER 37 C.F.R. § 1.131

I, Raymond Kwong, hereby declare as follows:

1. Applied Materials, Inc., is the owner of one hundred percent of the interest in United State Patent Application Serial No. 10/812,717. The assignment to Applied Materials, Inc., was recorded on March 29, 2004 on Real/Frame No. 015164/0571;

2. After referring to Applied Materials Human Resource (HR) records, I believe that the inventor, Padmanabhan Krishnaraj, is deceased;

3. In view of Exhibit A1-C and the declaration provided by Ms. Francimar C. Schmitt, I declare on behalf of the deceased inventor that the invention of pending claims 1-14 was conceived of prior to October 16, 2003, and filed with due diligence to the filing date of the present application on March 29, 2004;

4. I hereby declare that all statements made herein of my own knowledge are true, and that statements made on information and belief are believed to be true. Further, I hereby acknowledge that making willfully false statements is punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001, and that any such willful false statements may jeopardize the validity of the Application or any patent resulting therefrom.

Feb 11, 2008
Date

Raymond Kwong
Vice President, Applied Materials, Inc
Chief Intellectual Property Counsel and
Assistant Corporate Secretary

Exhibit A1

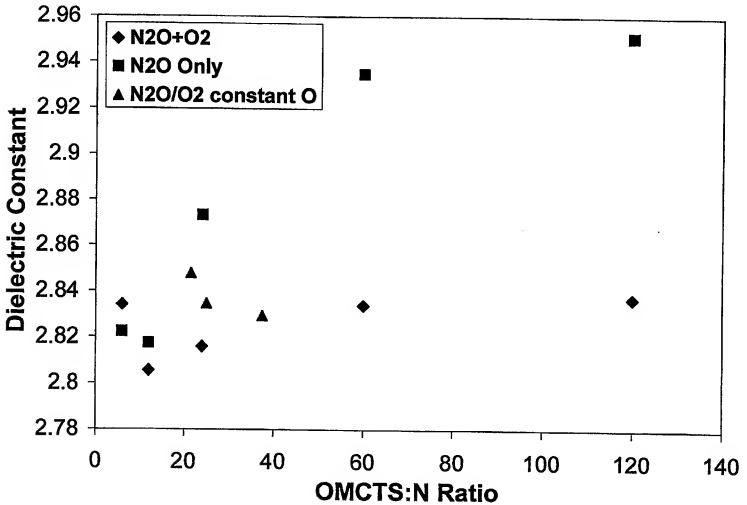


Exhibit A1

slot	recipe	As-Dep N2O	O2		DT	Thick	DR	Range	Unif	RI	CPT Thick	Cap	K	Stress	mod
17	FSN-1	1000	160		78	15217	11705	2125	3.66	1.396	13035.16	42.33	2.83	42.36	4.741
11	FSN-2	500	160		78	11852	9117	3068	6.94	1.405	10048.39	54.36	2.81	27.68	5.181
9	FSN-3	250	160		78	9478	7288	2220	6.92	1.411	8052	68.09	2.82	20.95	5.062
7	FSN-4	100	160		78	8423	6479	1839	5.65	1.415	7397.25	74.58	2.83	17.41	6.13
5	FSN-5	50	160		78	6115	8242	1196	4.49	1.418	7373.48	74.91	2.84	17.73	6.587
7	FSN-6	1000	0		78	13453	10348	917	1.82	1.410	12277.86	44.78	2.82	27.5	4.591
		700	0		84	12613	9009		3.38	1.423	11401.62	48.23	2.62	22.51	
		600	0		84	11592	8280		2.86	1.426	10675.07	51.53	2.62	19.02	
5	FSN-7	500	0		78	9765	7512	826	2.13	1.432	9284.03	59.08	2.82	15.1	6.131
3	FSN-8	250	0		78	7835	6027	652	2.05	1.448	7738.56	72.29	2.87	8.35	7.168
1	FSN-9	100	0		78	6784	5218	637	4.52	1.468	7040.13	81.17	2.93	5.668	8.535
23	FSN-10	50	0		78	6513	5010	821	4.61	1.478	6790.61	64.82	2.95	7.169	9.771
3	FSN-11	0	160	0	76	7774	5980	965	3.42	1.420	7156.1	77.84	2.86	20.1	
9	FSN-11	0	160	0	78	7789	5999	1097	3.55	1.420	7110.81	78.18	2.66	24.95	7.78
	FSN-16	30	146	0.1714	110	11375	6205	1658	3.36	1.421	10571	52	2.82	33.33	
	FSN-17	60	130	0.3168	110	11582	6317	1490	3.72	1.423	10617	51.81	2.80	30.62	
		100	110	0.4762	78	8145	6265	1368	4.95	1.422	7214.62	75.89	2.81	21.17	
13	FSN-12	160	80	0.6667	78	8150	6270	1470	5.08	1.428	7249.39	75.99	2.83	17	6.23
15	FSN-13	240	40	0.8571	78	8226	6328	1026	3.1	1.435	7621.72	72.41	2.83	15	6.28
19	FSN-14	280	20	0.9333	78	8273	6364	681	1.89	1.439	7888.35	70.29	2.85	12.52	6.19
21	FSN-15	280	20	0.9333	78	8068	6204	991	2.68	1.439	7494.39	73.98	2.85	1.97	

slot	recipe	EBK N2O	O2	DT	Thick	DR	Range	Unif	RI	CPT Thic	Cap	K	Stress	thick delta	shrink%	shrinkU%	
17	FSN-1	1000	160		15083		2142.9		1.4296	12676	42.156	2.76	50.34	153.6	1.01	7.81	5.416
11	FSN-2	500	160		11718		3052.8		1.4092	9917	54.209	2.76	38.28	132.04	1.11	7.48	5.607
9	FSN-3	250	160		8362		2209		1.4113	7953.1	67.662	2.76	35.37	112.53	1.19	16.44	5.969
7	FSN-4	100	160		8326		1680.9		1.4122	7288.3	74.009	2.77	34.05	97.58	1.16	14.31	6.774
5	FSN-5	50	160		8019		1194.7		1.417	7283.7	74.639	2.79	34.99	96.14	1.18	11.14	7.178
7	FSN-6	1000	0		13365			1.65	1.4076	12167	44.494	2.78	36.45	88.83	0.66	18	4.065
5	FSN-7	500	0		9709			2.24	1.4291	9218.2	58.635	2.78	29.66	89.91	0.57	27.73	6.72
3	FSN-8	250	0		7821			2.04	1.4412	7718.4	71.588	2.84	26.3	13.63	0.17	47.67	7.451
1	FSN-9	100	0		6754			4.51	1.4629	7002.8	80.59	2.90	24.76	30.36	0.45	13.83	9.302
23	FSN-10	50	0		6481		809.13		1.4337	6750.7	84.066	2.92	29.46	32.34	0.50	23.58	10.296
3	FSN-11	0	160		7878		980.12		1.4141	7050.6	77.44	2.80	38.97	96.37	1.24	8.27	8.33
9	FSN-11	0	160		7709			3.64	1.4175	7016.3	75.639	2.80	39.3	91.07	1.17	6.11	8.33
	FSN-16																
	FSN-17																
13	FSN-12	160	80		8098		1471.6		1.4036	7184.5	75.264	2.78	24.78	52.11	0.64	13.81	6.855
15	FSN-13	240	40		8194		1008.3		1.4229	7590.6	71.813	2.78	25.32	32.29	0.39	28.34	6.867
19	FSN-14	280	20		8243		675.04		1.3852	7862.8	69.463	2.81	32.46	29.75	0.36	28.41	7.362
21	FSN-15	280	20		8040		881.7		1.4339	7467.2	73.983	2.81	21.97	24.6	0.31	29.78	

C2H4 As-Dep Flow Splits (80O2/160N2O) / C2H4 Post EBK Flow Splits (80O2/160N2O)

	C2H4	thick	DT	DR	range	unif	cpthick	cap	k	stress	M	H	C2H4	thick	Del thick	shrink	shrinkU	range	unif	RI	cpthick	cap	k	stress				
	0	10214.3	95.7	6404	2069	5.05	9046	60.44	2.82	13.420			0	10142	63.1	0.6178	51.85	1795	4.99	1.4237	6985	69.91	2.77	28.770				
12F	3000	5817.31	95.7	3522	666	3.31	5918	95.76	2.82	-22.070			3000	9611	3.92	0.0698	566.8	698	3.6	1.4695	5916	94.744	2.88	2.522			2.79	50.34
12E	2000	6283.25	95.7	3939	613	3.33	6740	82.49	2.67	-6.156			2000	6263	16.81	0.2675	143.8	855	3.49	1.4545	6726	81.541	2.82	16.250			2.76	38.29
12D	1000	7636.28	95.7	4788	568	2.03	7878	69.44	2.82	7.154	6.118	0.881	1000	7621	10.79	0.1413	310.6	674	2.35	1.4321	7884	69.662	2.76	25.000	6.298	0.928	2.78	36.37
12C	750	8170.3	95.7	5122	478	1.5	8216	66.04	2.80	10.490	5.633	0.807	750	8143	16.04	0.1963	164.1	618	1.61	1.4295	8216	65.311	2.78	27.510	5.979	0.872	2.77	34.05
12B	500	8802.12	95.7	5518	534	1.54	8658	62.76	2.80	12.960	5.379	0.774	500	8744	53.22	0.6046	68.99	643	1.57	1.432	8625	61.838	2.74	28.920	5.839	0.856	2.79	34.99
12A	250	9592.64	95.7	6014	1069	2.82	8174	59.08	2.79	14.980	3.839	0.389	250	9612	76	0.7923	55.73	964	2.78	1.4302	9123	58.68	2.75	29.600	6.337	0.944		

2.78	36.45
2.78	29.66

as dep post EBK

N2O Process Window for Lower K check

spacing	thick	DT	DR	range	unif	RI	cpthick	cap	k	stress				
450	8150	78	6270	1470	6.08	1.428			2.83	6				
475	10724.2	100	6435	1697.12	4.29	1.425	9812	56.859	2.61	16.05				
500	10841.1	100	6505	1578.13	3.89	1.423	9625	55.734	2.82	12.82				
pres														
5	8150	76	6270	1470	5.08	1.428			2.83	6				
6.5	10637	100	6382	1970.16	5.21	1.423	9422	57.635	2.79	12.77				
6	10638.7	100	6383	2065.54	5.84	1.418	9421	58.959	2.78	17.19	0.665	4.522	0.79	5.226
RF														
500	8150	78	6270	1470	5.08	1.426			2.83	6				
475	16415.2	100	6248	1761.44	4.69	1.428	9335	58.385	2.80	14.76				
450	10173.6	100	6104	1745.08	4.7	1.424	9088	89.81	2.80	15.07				

2.84	26.3
2.80	24.78
2.92	29.46
2.80458	38.97
2.6	39.3
2.77752	24.76
2.7683	25.32
2.80542	32.48
2.81393	21.97

C2H4 No O2 600N2O AsDep / C2H4 Post EBK No O2 600N2O Post EBK

	C2H4	thick	DT	DR	range	unif	cpthick	cap	k	stress	C2H4	thick	Del thick	shrink	shrinkU	range	unif	RI	cpthick	cap	k	stress
	0	11591.9	84	8280	1316	2.86	10676	51.53	2.82	19.020												
7NC1	250	10504.8	66	7329	683	2.19	10738	50.86	2.80	16.010												
7NC2	500	9617.41	80	6545	1000	3.9	10191	53.16	2.78	14.610												
7NC3	750	9388.72	94	5993	1365	5.21	9663	55.11	2.80	12.800												
7NC4	1000	9233.3	100	5540	1590	5.84	9796	55.66	2.80	11.760												
7NC5	2000	9601.76	120	4301	1772	6.71	9161	60.49	2.84	2.951												
7NC6	3000	8348.05	140	3578	1676	6.29	8972	63.11	2.91	-7.605												

0	2.61892	13.42	2.82	19.020
250	2.79373	14.98	2.80	16.010
500	2.80119	12.86	2.78	14.610
750	2.797	10.49	2.80	12.800
1000	2.81975	7.154	2.80	11.760
2000	2.86589	-6.156	2.64	2.951
3000	2.92134	-22.07	2.91	-7.605

2.8341	42.36
2.8055	27.66
2.8159	20.95
2.8339	17.41
2.8371	17.73
2.8224	27.5
2.8175	15.1
2.8793	6.35
2.9349	5.668
2.9513	7.169
2.8611	20.1
2.8557	24.95
2.8294	5.795
2.8348	5.824
2.8478	12.52
2.8471	1.97

TFMS 4.11a16

Saved measurement

Active file: PRODUCER\BDII\BDII_3MM

3:21:38 pm [redacted]

ENG LOC UNQ PP

Date/Time, Cas/Slt, Avg(t1), Avg(n1), Rng(t1)

Date/Time	Cas/Slt	Avg(t1)	Avg(n1)	Rng(t1)
[redacted]09:54	01/17	11375.45	1.4245	1816.41
[redacted]09:56	01/19	11581.93	1.4227	1649.68
[redacted]09:58	01/21	11494.81	1.4206	1527.95
[redacted]10:00	01/23	12612.90	1.4226	1593.88
[redacted]12:13	01/23	6699.70	1.5382	21847.89
[redacted]12:15	01/25	7687.76	1.5592	21649.99
[redacted]12:28	01/06	9959.04	1.4440	3633.52
[redacted]12:30	01/07	9556.36	1.3375	6126.81
[redacted]12:32	01/08	9134.11	1.4168	5838.25
[redacted]12:34	01/09	9192.83	1.3754	3389.95
[redacted]12:36	01/10	6783.93	1.3263	4038.47
[redacted]12:55	01/11	9662.48	1.4028	4075.91
[redacted]12:57	01/12	9127.39	1.4861	4325.68
[redacted]12:59	01/13	9544.18	1.4014	4054.38

Ratio → CFSN: 78

Exit

More

Param

Print

OP5340/59189/8249

CFSN 78 [illegible]

[illegible] 22.51

[illegible] 48.732

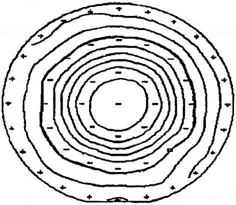
k = 2.52 [illegible]

Exhibit C

IFMS 4.11a16	Polar Map measurement results Active file: PRODUCER\BDII\BDII_3MM	3:12:20 pm [redacted]

Cassette station: 1 Slot: 9 Wafer ID: ENA LOC INA AP

Layer 1 Thickness



Exit

Display

Param

List

Mean : 8144.77 A Std Dev : 403.35 A (4.95 %)
Min : 7214.62 A Max : 8582.52 A Range : 1367.89 A
Center pos : (0.000, 0.000) mm Size : 294.000 mm
Contour interval : 162.98 A (2.000 %)

Print

OP5340/59189/8249

	H	C	O	Si
asdep	28.8	25.1	20.2	25.9
EBC	27.1	25.5	21.6	25.8

Cp = 7214.62
stress = 21.17

Cap = 75.99 As DEP
k = 2.81

Ref Ox = 148.1
Tox 5131.5

N_2O = 100 sccm
O_2 = 110 sccm
~~ϕ~~ FS-N-16